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Student Quality in the Sciences and Engineering: Opinions of Senior Academic Officials

Frank J. Atelsek

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HIGHLIGHTS

The survey findings are based on the opinions of academic officials at institutions with undergraduate programs and with graduate programs in the sciences and engineering. A separate study was conducted for the humanities. Its results are reported in HEP Report No. 59, Student Quality in the Humanities: Opinions of Senior Academic Officials.

Undergraduate Students

- Most officials (61 percent) believed that student quality had not changed significantly over the last five years. About one-fourth thought that quality had improved and roughly one-sixth, that significant declines in quality had taken place.

- At private institutions, officials at doctorate-granting institutions more often expressed a positive view about student quality than did their colleagues at institutions without doctoral programs (32 percent and 18 percent, respectively). Such differences in view did not occur among officials at public institutions.

- Officials were asked whether their most able undergraduate students were shifting toward or away from the science and engineering (S/E) fields. The majority opinion (53 percent) was that no such shifts had occurred over the past five years. Of the remainder, most believed that the shifts were toward the S/E fields rather than away from them (40 percent and 7 percent, respectively).

- The latter opinion about the most able students shifting toward the S/E fields was especially prevalent among the 100 institutions with the greatest baccalaureate production in S/E fields. Three quarters of the officials at such institutions believed that the distribution of their most able students had shifted. Further, all were of the opinion that the shifts were toward S/E fields.

- Changes in student views about their employment chances after receiving the baccalaureate degree was considered the dominant reason for shifting majors to S/E fields.

- About two-fifths of the officials also believed that the distribution of their most able majors in S/E fields had shifted over the past five years. Of these shifts, computer science was most cited as a recipient field by 32 percent of the officials, engineering by 18 percent, and the physical sciences by 6 percent.

Applicants for Graduate Study

- Among officials at graduate institutions, three of every five believed the quality of applicants for graduate study in S/E fields had not changed significantly over the previous five years. Only one in eight thought the quality of applicants had declined. Of the 28 percent who believed quality had improved, six out of ten believed the improvements were confined to a few S/E fields rather than to S/E applicants overall.

o The officials based their judgments of the quality of graduate school applicants most often on faculty perceptions, closely followed by undergraduate grade-point averages.

o Almost half of the officials thought applicants with baccalaureates from foreign institutions were as qualified for S/E graduate study as applicants with U.S. baccalaureates. Of the remaining officials, however, the preponderant majority (by a ratio of over four to one) believed that applicants with U.S. baccalaureates had significantly better qualifications.

Doctorate Recipients

o In comparing the quality of recent Ph.D. recipients (1981-82) with those from the 1976-77 period, two-thirds of the officials saw no significant difference between the two groups. Of the remaining one-third, however, four of every five thought the 1981-82 group was significantly better qualified.

BACKGROUND

In the fall of 1982, the National Science Foundation requested a Higher Education Panel study of the opinions of senior academic officials about changes in the quality of students in science and engineering fields over the last five years. The Foundation sought this information as part of its larger concern about the current status of science and engineering in this country.

At the same time, the National Endowment for the Humanities was interested in obtaining information about the quality of students in the humanities. It was decided, therefore, to conduct the two surveys concurrently.[1] The science and engineering questionnaires--one concerning undergraduates and one concerning graduate students--were sent to the Panel representative on each applicable campus with the request that they be completed by senior academic officers acquainted with the institution's academic atmosphere over the past five years. It was suggested that the dean of the college of arts and sciences or, at the larger institutions, the dean of the sciences division would be the appropriate respondent for the undergraduate questionnaire, and that the dean of the graduate school could best complete the graduate questionnaire. However, as always, the final decision was left to the individual HEP representative on each campus.

Copies of both the undergraduate and graduate survey instruments are found in Appendix A. The undergraduate form went to all four-year colleges or universities in the Panel except theological seminaries, independent medical schools, and schools of art. The graduate form was sent only to those institutions that had awarded 50 or more master's degrees in 1981. This

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[1]See HEP No. 59. Student Quality in the Humanities: Opinions of Senior Academic Officials (Washington: American Council on Education) February 1984.